

RESPONSE TO IDEM RWP RESPONSE TO COMMENTS & ADDENDUM I REVIEW

**MICHIGAN PLAZA
3801-3823 WEST MICHIGAN STREET
INDIANAPOLIS, INDIANA**

FACILITY NUMBER: 009937

IDEM INCIDENT NUMBER: 0000198

MUNDELL PROJECT NO.: M01046

JANUARY 16, 2009



MUNDELL & ASSOCIATES, INC.

Consulting Professionals for the Earth and the Environment

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January 16, 2009

Ms. Erin Brittain
Project Manager
Indiana Department of Environmental Management
Voluntary Remediation Program
Office of Land Quality
100 North Senate Avenue
Indianapolis, Indiana 46204

Re: **Response to IDEM's Remediation Work Plan Response
to Comments & Addendum I Review,
Michigan Plaza**
3801-3823 West Michigan Street
Indianapolis, Indiana 46222
IDEM Incident # 0000198
MUNDELL Project No. M01046

Dear Ms. Brittain:

This response is being submitted to the Indiana Department of Environmental Management (IDEM) by MUNDELL & ASSOCIATES, INC. (MUNDELL), on behalf of AIMCO, as a response to IDEM's letter, '*Remediation Work Plan Response to Comments and Addendum I Review*' dated November 17, 2008. Activities are being performed by MUNDELL to address the outstanding items detailed in IDEM's letter. Any remaining items will be addressed pursuant to gathering the necessary data, which will be compiled and presented in future reports.

IDEM Comment No.1. The report did not clearly define "shallow" and "deep" contamination. The recent groundwater grab samples were taken at four depths in the aquifer. Is the "shallow" contamination at the water table, or is it the top 10 feet of the water table? Which of the lower sample depths is considered "deep"? Are the corresponding "deep" wells also screened in this interval? Since there is contamination at all four depths in the grab samples, should additional samples be taken at all four depths? All of these questions must be answered in the final RWP.

MUNDELL Response: MUNDELL believes these questions will be clarified through the sampling of the most recent upgradient well installations approved by IDEM. MUNDELL completed installation of two deep (MMW-13D (screened from 35 to 50 feet bgs) and MMW-14D (screened from 39 to 49 feet bgs) and two shallow monitoring wells (MMW-11S and MMW-12S) upgradient of *Source Areas B and C* (see attached **Figure 1**) in November and December 2008. Per discussion with IDEM, MMW-11S, (which is screened from 23 to 33 feet bgs, and is essentially a deep well since the lower glacial till 'hard pan' was encountered

at the base of the well), would enable establishing a full vertical profile north of *Source Area B*. This former MMW-11S is renamed and will be referred to as MMW-11D in any future submittals. Data from these new upgradient deep (and shallow) wells will help define the water quality of the 'shallow' and 'deep' aquifer coming into the Michigan Plaza chemical source areas, and aid in the discernment of any upgradient aquifer impacts attributable to the Genuine plume continuing to enter the northern boundary of Michigan Meadows Apartments and move southward through the Site.

Groundwater quality in the lower aquifer in the Floral Park area will be re-evaluated in light of the upgradient lower aquifer analytical results over the next quarter, and after further remediation of the aquifer (i.e., the CAP-18 injection Round No. 2 scheduled in February 2009).

IDEM Comment No.2. Because of the high potential for these contaminants to sink in the water column even at low concentrations, IDEM cannot consider that all of the deep contamination within and down-gradient of Michigan Plaza's source areas is related to the Genuine Parts plume. However, based on the data available to date, it appears that some of the deep contamination on the Michigan Plaza and Floral Park properties is attributable to the Genuine Parts release. All deep contamination north of MW -1S and MW-11S on the Michigan Meadows Apartment property appears to be wholly related to the Genuine Parts plume. The extent of this contamination will not be apparent until quantitative and validated results are available from the proposed deep wells immediately up-gradient of the Michigan Plaza sewer releases.

MUNDELL Response: MUNDELL agrees. The extent of this contamination will not be apparent until quantitative and validated results are available from the new deep wells upgradient of the Michigan Plaza sewer releases. These upgradient wells will be incorporated in the quarterly monitoring network starting first quarter 2009, and the data will be presented in future reports.

IDEM Comment No.3. Deep contamination from the sewer line releases and southward appears to be partially attributable to the Michigan Plaza release. This is based on the following lines of reasoning:

- a. The mass of adsorbed contaminants detected along the sewer and in the parking lot is many times the groundwater solubility level (up to 26,000 ppb PCE), so the potential for DNAPL is very high.
- b. TCE was initially detected in well MMW-P-10D but has not been detected in up-gradient wells MW-l65D or MW-l66D since monitoring was started in 2002.
- c. 1,2-DCE levels in MMW-P-l0D remain similar to pre-remedial levels, but vinyl chloride concentrations have increased two-fold.
- d. Well MMW-P-03D contained PCE prior to remediation.
- e. The large, unpaved areas south of the Michigan Plaza building allow shallow contaminants to sink quickly due to recharge.

f. Grab samples immediately down-gradient of MMW-P-O3D (GP-C-06) contained moderate levels of shallow contamination and minimal deep contamination, but additional further down-gradient deep samples (GP-C-07 and 08) contained DCE and vinyl chloride above residential levels.

MUNDELL Response: As indicated previously, the additional data from the new upgradient wells will provide support for determining the deeper aquifer impacts attributable from Genuine. As indicated in the RWP, releases of PCE and TCE from the sewer appear to be confined to the south-central (*Source Area B*) and southeastern (*Source Area C*) locations. The vertical extent of these releases appears to be most severe in the shallow, upper 10 ft of the saturated aquifer, with much lesser impacts observed at depths of up to 40 ft below the existing ground surface (from whatever source).

The data at GP-C-07, GP-C-08, and GP-C-09 locations on the Floral Park property (RWP Addendum I) shows a definitive increase in VC as the borings test deeper. There is no shallow PCE (or TCE) present at the GP-C-07, GP-C-08, and GP-C-09 locations, indicating complete delineation of the shallower impacts emanating from Michigan Plaza. The presence of vinyl chloride in the deeper aquifer without any shallower PCE/TCE at these locations indicates impacts from Genuine at a deeper level in the aquifer. However, data from the recently installed upgradient deep (and shallow) wells will help clarify the comingling of plumes from the Genuine-Michigan Plaza sources, and aid in the determination of the contribution of each to the impacts observed in the downgradient aquifer.

IDEM Comment No.4. Four quarters of data have been submitted since the initial CAP 18 injections. As the contaminants biodegrade to DCE and vinyl chloride, they also become less amenable to reductive processes. Vinyl chloride, in particular, is often best remediated by oxidation. Since most of the plume has already degraded to less chlorinated VOCs, the consultant may wish to investigate manipulating the redox potential of the groundwater. Much additional information on bioremediation of chlorinated solvents is available from the Interstate Technology and Regulatory Commission (ITRC) at www.itrcweb.org.

MUNDELL Response: MUNDELL agrees. The CAP-18 injection (performed in August 2007) results are very encouraging overall; however a second round of CAP-18 injection has been scheduled in February 2009, to aggressively treat areas where the concentrations are stable or just barely decreasing in contaminant levels. MUNDELL will look into manipulating the redox potential of the aquifer to treat the remnant vinyl chloride impacts, after the results of this second round of CAP-18 injection.

IDEM Comment No.5. The consultant has proposed to reduce the list of chemicals of concern to those listed in Table 2. In addition to these analytes, ethene, 1,2-dichloroethane (1,2-DCA) and 1,1-dichloroethane (1,1-DCA) should be analyzed.

MUNDELL Response: MUNDELL has added these analytes to the list.

IDEM Comment No.6.. Response 2: The consultant has placed shallow wells south of the MMW-P-03 nest and intends to monitor annually down-gradient wells MMW-P 09S and 09D. Given the unusual distribution of deep contaminants in borings down-gradient of MMW-P-03D, IDEM recommends at least one additional deep well in the vicinity of MMW-C-09. Since, with four quarters of data available, it is clear that the CAP 18 remedy is having some effect on deep contaminants, the change in deep concentrations needs to be monitored within or near the one year travel time of the injections. Also, IDEM cannot support the reduction of monitoring until the full effects of the remedy are known.

MUNDELL Response: MUNDELL agrees.

IDEM Comment No 7.. Response 6: IDEM's concern regarding the source of the indoor air contamination was not directly answered by the referenced responses to this comment. The two referenced responses deal with the actions taken to abate indoor air vapors and the potential for further remediation and sampling. Please provide evidence within the text of the RWP that makes it clear that contaminated indoor air appears to be due to the shallow Michigan Plaza release rather than Genuine Parts.

MUNDELL Response: The Michigan Plaza release (shallow aquifer) is a significant contributing factor to the indoor air impacts near Source Areas A, B or C. However, ambient air monitoring has demonstrated the presence of indicator compounds in the general background air in this area of Indianapolis. During the April 2008 air sampling round, an ambient sample collected west of the plaza building indicated the presence of PCE. Therefore, the general ambient air condition must also be taken into account when evaluating indoor air impacts.

IDEM Comment No.8.. Response 7: In the October 29, 2008 meeting, IDEM questioned why there was no additional soil sampling planned in Source Area C. The consultant explained that the contaminated area is narrow here and nearly the entire mass is located directly below the sewer line. Sampling this area directly would be very difficult. This explanation is acceptable. Contaminant levels from the other borings can serve as a general baseline to what is present in this area.

MUNDELL Response: MUNDELL agrees.

IDEM Comment No. 9. Response 8: The proposal to install two up-gradient deep wells rather than the three initially suggested by IDEM is generally acceptable. However, both wells are planned to be at least 100 feet up-gradient of the known sources of shallow contamination. Deep wells should be within 20 feet of the known source areas.

MUNDELL Response: Monitoring well MMW-11S is in the range of 20 to 30 feet from the plume (*Source Area B*, see attached **Figure 1**). The clay till isopleth map (*Refer to Fig 44 from the RWP*), indicates the hard pan (ranging from 32 to 37 feet in the area) represents the base of the aquifer and limited the depth of installation of MMW-11S. Hence, MMW-11S (screened from 23 to 33 feet to top of till) is essentially a deep well and is renamed MMW-11D.

After multiple data sets, we believe that the plume resulting from the sewer release (*Source Area C*) actually extends slightly north of what was initially thought (maybe to the northern edge of Building 1). The upgradient deeper wells are, therefore, slightly further away from the *Source Areas B and C* as a part of the effort to discern what is coming into the area from the upgradient Genuine plume.

IDEM Comment No.10. Response 11: While the installation of deep wells near the sewer line sources of the Michigan Plaza plume will assist in understanding the vertical and horizontal distribution of contamination, it is premature to declare them "background" wells without the supporting analytical data. The background/upgradient concentration will have to be explicitly defined. Accordingly, to achieve closure through the VRP, a site-specific risk assessment would need to be performed if contaminant levels are above RISC residential closure levels on the apartment property.

MUNDELL Response: MUNDELL agrees, and expects the monitoring of the upgradient condition over time will determine what the Genuine contribution is to the area. In addition, the expectation is that Genuine is required to achieve RISC residential closure levels for their plume coming onto the Michigan Meadows Apartments.

IDEM Comment No.11. Please be advised that a sampling event south of Cossell Road or south of the Floral Park Cemetery property is necessary to fully delineate vinyl chloride in the groundwater. As of September 2008, the vinyl chloride in well MMW-P-09D was 72.6 ug/kg, which is above both the residential and industrial RISC closure levels. The extent of contamination needs to be defined to RISC residential default closure levels. The IDEM is willing to send correspondence to the Floral Park Cemetery property owner should you require assistance for off-site access.

MUNDELL Response: MUNDELL believes that the groundwater impacts observed in the deeper aquifer just north of the downgradient cemetery property represents a unique setting that does not currently represent a threat to human health or the environment (*i.e.*, a very large

cemetery property extending further south of Cossell Road with no receptors within 1,800 to 2,000 ft; see **Figure 2** for the nearest property/receptor information). In addition, MUNDELL believes the deeper aquifer impacts are currently being evaluated with the installation and testing of the new upgradient wells to determine whether they are attributable to Genuine or Michigan Plaza. MUNDELL recommends that we notify Floral Park of the existing groundwater impacts, and work toward gaining access to their property to determine where acceptable future monitoring locations are possible.

General Comments -

Please find attached (**Figure 3**) the proposed CAP-18 ME injection (Round 2) locations. MUNDELL will proceed with the additional soil and groundwater sampling beneath and around the Plaza building, and also in *Source Area B* (as detailed in the *RWP Addendum I, November 6, 2008*) for addressing the soil medium in February 2009. MUNDELL will oversee the advancement of geoprobe borings inside the building with a small LT-50 rig, which would allow drilling/testing inside the building in locations yet uncharacterized, followed by CAP-18 ME injection in select boring locations.

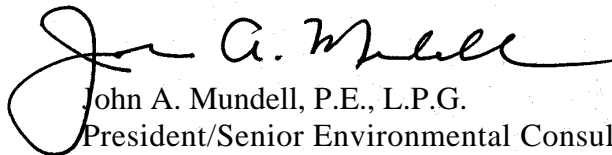
Please let us know if you have questions. Thank you for your consideration.

Sincerely,

MUNDELL & ASSOCIATES, INC.



Leena A. Lothe
Project Environmental Engineer



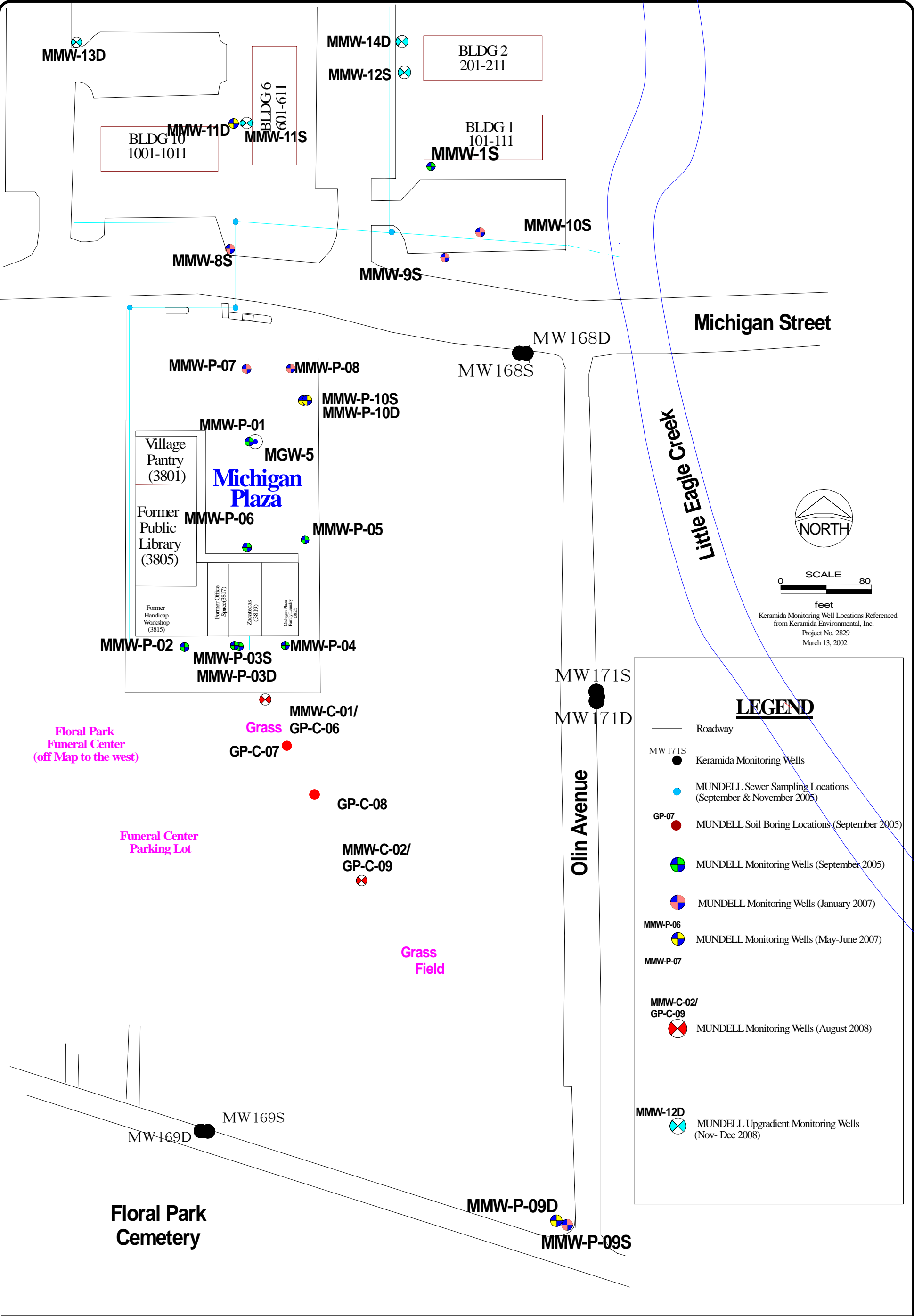
John A. Mundell, P.E., L.P.G.
President/Senior Environmental Consultant

/lal

Attachments: Figures

cc: Mr. Stephen Evanoff, AIMCO

FIGURES



MUNDELL & ASSOCIATES, INC.

Consulting Professionals for the Earth & Environment

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Project Number:
M01046

Drawing File:

Date Prepared:
12/23/09

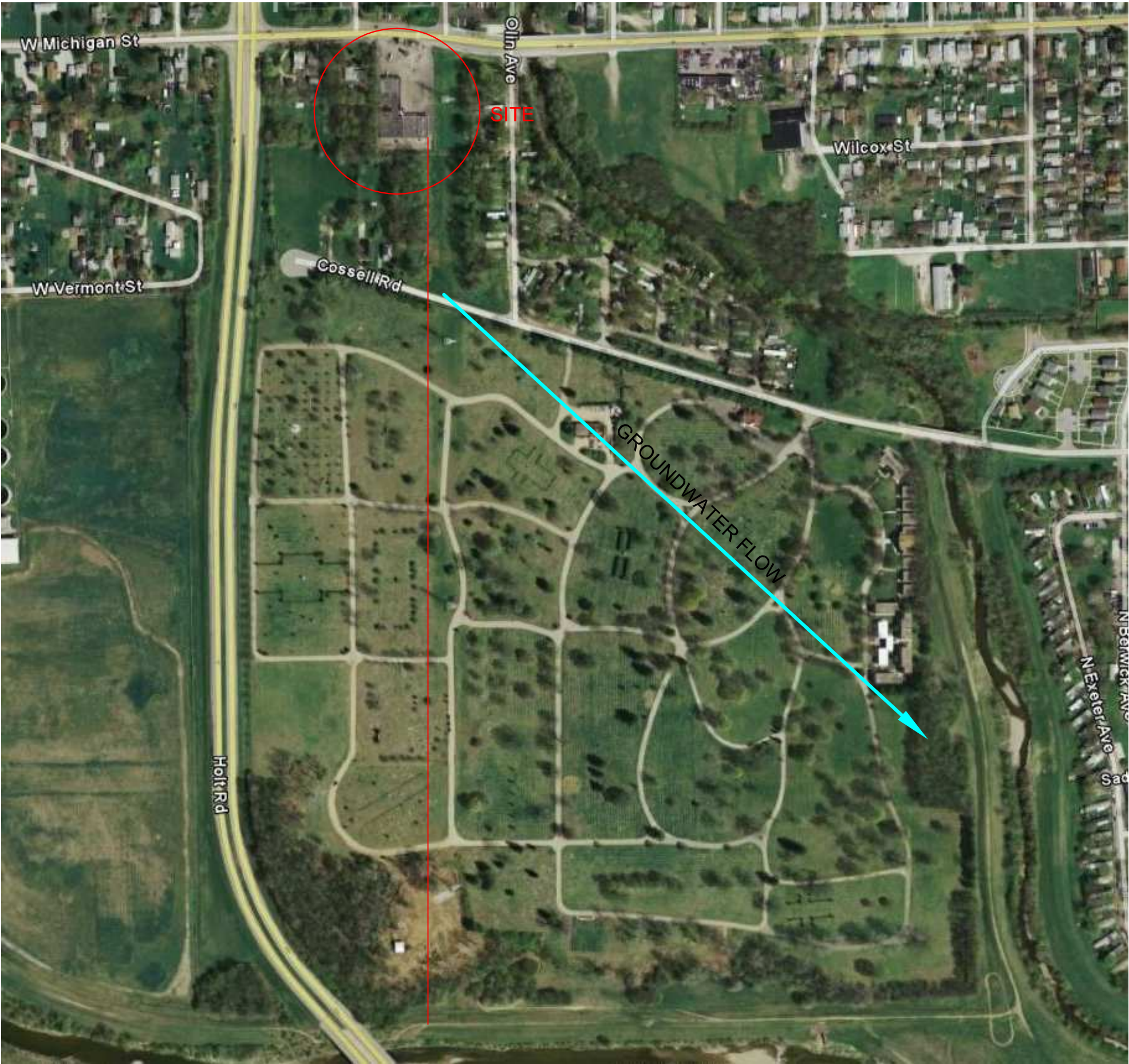
Scale:
1"=80'

**UPGRADIENT MONITORING WELL LOCATIONS
(NOV-DEC 2008)**

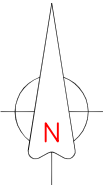
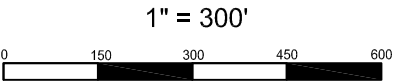
Michigan Plaza
3801-3823 West Michigan Street
Indianapolis, Indiana

FIGURE

1



LEGEND



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REV.	DATE	DESCRIPTION	BY	APPR.

PROJECT NO.: M08045	FILE NO.: 1.DWG
DRAWING: 1"=300'	PLOT SIZE: 11"X17"
DRAFTED BY: ABV	DATE: 1/13/09
CHECKED BY: JRH	DATE: 12/3/08
APPROVED BY: CDJ	DATE: 12/3/08

Nearest Property/Receptor Location

INDIANAPOLIS

FIGURE

2

